# Request for Economic Stimulus Funds

## Concept Proposal

Submitters (Name of Workgroup & Chair/Co-Chairs): **Energy and Sustainability – (Dr. Doug Whitlock and Dr. Jim Tracy)**

Project Title: **Compost-heated Greenhouse Scale-up**

Project Partners (Known or Anticipated): **WKU, local grower, NRCS, Kentucky Bioprocessing**

Project Background & Purpose (Justification for Project):
Several growers and one person who grows tomatoes hydroponically approached WKU with the problem that they could not afford to heat their greenhouses during the winter because of the high cost of propane and other forms of energy. Kentucky Bioprocessing, Inc. also needs greenhouse capacity whereby they could grow tobacco year round. Again, the cost is prohibitive and they have lost potential clients because of this problem. Two Applied Research and Technology Program of Distinction Centers, Agricultural Research and Education Complex and Engineering Services, joined forces to tackle this problem.

WKU is paid by the city to take its leaf litter (saving the city approximately $40,000 per year in transport costs to a landfill. The leaves are composted with animal waste during the winter and the compost product is sold in the spring to gardeners. The money goes toward student scholarships. Meanwhile microbes are generating approximately 130$^{o}$F during the composting process over the winter months. Working with engineering students, agriculture students helped design and construct a system to heat a greenhouse using the compost heat. The heat exchange system and greenhouse have been built and are awaiting testing.

Benefits: A Kentucky businessman has developed a hydroponic sytem for growing tomatoes year round. He has generated $225,000 in revenue/year in his backyard in four greenhouses. He can no longer afford the propane to heat the greenhouses in the winter and this fact has drastically harmed his bottom line to where it may not be economical. In Owensboro, Kentucky Bioprocessing, LLC grows pharmaceuticals in tobacco. Large U.S. and international pharmaceutical companies have expressed interest in their technology but cannot afford to grow tobacco only in the summer. Therefore, increased capacity of economically heated greenhouses will benefit this novel pharmaceutical company as it will the gentleman growing tomatoes hydroponcally. Demonstrating a commercial scale greenhouse heated by compost heat supplemented by solar power could make the above companies and others more competitive in

the global marketplace, increase their market share, and create jobs. The potential economic impact is tremendous.

Project Description (General Goals & Implementation Strategies):
The goal is to scale-up the compost-heated greenhouse to a commercial scale for demonstration and economic development purposes. A prototype is already built, it simply needs to be scaled.

Project Team (Project Manager(s), Content Experts, Instructional Designers, etc.): Dr. Jack Rudolph, the USDA/ARS scientists, and students.

Project Budget & Amount of Economic Stimulus Funds Requested:

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| Already invested by WKU in this project | $45,000 |
| Stimulus package: to replicate this unit at a large scale | $1,500,000 |